

1. A sheet manufacturing method, comprising the steps of:
cooling a base having protrusions;
dipping surfaces of said protrusions of said cooled base into a melt material containing at least one of a metal material and a semiconductor material; and
forming crystals of said material on the surfaces of said protrusions.
2. A sheet manufacturing method, comprising the steps of:
rotating a roller with protrusions on its peripheral surface and a cooling portion capable of cooling said protrusions;
dipping surfaces of said cooled protrusions into a melt material containing at least one of a metal material and a semiconductor material; and
forming crystals of said material on the surfaces of said protrusions.
3. The sheet manufacturing method according to claim 1, wherein said protrusions have at least one of dot-like protrusions and linear protrusions.
4. The sheet manufacturing method according to claim 2, wherein said protrusions have at least one of dot-like protrusions and linear protrusions.
5. The sheet manufacturing method according to claim 1, wherein said protrusions have at least one of dot-like protrusions and linear protrusions in addition to planar protrusions.
6. The sheet manufacturing method according to claim 2, wherein said protrusions have at least one of dot-like protrusions and linear protrusions in addition to planar protrusions.

7. The sheet manufacturing method according to claim 1, wherein said protrusions are coated with a coating material of at least one of silicon carbide, boron nitride, silicon nitride and pyrolitic carbon.

8. The sheet manufacturing method according to claim 2, wherein said protrusions are coated with a coating material of at least one of silicon carbide, boron nitride, silicon nitride and pyrolitic carbon.

9. The sheet manufacturing method according to claim 1, wherein crystal growth of said material starts from said protrusions.

10. The sheet manufacturing method according to claim 2, wherein crystal growth of said material starts from said protrusions.

11. A sheet produced by cooling a base having protrusions, dipping surfaces of said protrusions of said cooled base into a melt material containing at least one of a metal material and a semiconductor material, wherein said sheet has a curve portion obtained by forming crystals of said material from protrusions on the surface of said base in a curved shape.

12. A sheet produced by cooling a base having at least one of dot-like protrusions and linear protrusions in addition to planar protrusions and dipping surfaces of said protrusions of said cooled base into a material containing at least one of a metal material and a semiconductor material, wherein said sheet has curved portions and planar portions obtained respectively by forming crystals of said material from said dot-like protrusions or linear protrusions on the surface of said base in a curved shape and by forming crystals of said material from planar protrusions on the surface of said substrate in a planar shape.

13. A sheet manufacturing apparatus, comprising:
a roller having on its peripheral surface protrusions and a cooling portion for cooling said protrusions; and

a crucible including a melt material containing at least one of a metal material and a semiconductor material and capable of dipping said protrusions into said melt by rotation of said roller.

14. A solar cell produced by forming an electrode on a sheet formed by cooling a base with protrusions and dipping the surfaces of said protrusions of said cooled base into a melt material containing at least one of a metal material and a semiconductor material, wherein said sheet has curved portions obtained by forming crystals of said material from said protrusions on the surface of said base in a curved shape.

15. A solar cell produced by forming an electrode on a sheet formed by cooling a base with at least one of dot-like protrusions and linear protrusions in addition to planar protrusions and dipping a surface of said cooled base into a melt material containing at least one of a metal material and a semiconductor material, wherein said sheet has curved portions and planar portions obtained respectively by forming crystals of said material from said dot-like protrusions or linear protrusions on the surface of said base in a curved shape and by forming said crystals of said material from said planar protrusions on the surface of said base in a planar shape.

16. The silicon sheet manufacturing apparatus of manufacturing a silicon sheet by solidifying a silicon melt by rotation of a cooling roller for crystal growth, characterized in that said cooling roller has in its surface protrusions arranged in a dot-like pattern or in a linear pattern when viewed from above.

17. The silicon sheet manufacturing apparatus according to claim 16, characterized in that a space between said protrusions is in a V or U like shape.

18. The silicon sheet manufacturing apparatus according to claim 16, characterized in that the surface of said cooling roller is covered with an

SiC film.

19. The silicon sheet manufacturing apparatus according to claim 17, characterized in that a pitch of said V or U grooves is at least 0.05mm and at most 5mm.

20. The silicon sheet manufacturing apparatus according to claim 16, wherein a height of said protrusions is at least 0.05mm and at most 5mm.

21. A silicon sheet manufacturing method of manufacturing a silicon sheet by solidifying a silicon melt by rotation of a cooling roller for crystal growth, characterized in that said crystals grow from protrusions of said cooling roller arranged in a dot-like pattern or in a linear pattern when viewed from above.

22. A solar cell produced by rotating a roller having on its peripheral surface protrusions having at least one of dot-like protrusions and linear protrusions and a cooling portion for cooling said protrusions, and dipping surfaces of said cooled protrusions into a silicon melt so that silicon crystals grow on the surfaces of said protrusions.